A line M which makes the secondary moment of the set of pixels, such as that of pixels constituting the outline E can be obtained, for example, by the following calculation.

A straight line M indicated by an expression (3), as shown in Fig. 60, will be taken as an example.

$$x\sin\theta - y\cos\theta + \rho = 0 \qquad (3)$$

The secondary moment for the straight line M can be indicated by an expression (4) where Ri indicates the distance between the straight line M and each point (xi, yi) of the set of pixels constituting the outline E.

$$m = \sum_i Ri^2 = \sum_i (x_i \sin\theta - y_i \cos\theta + \rho)^2 \qquad (4)$$

The straight line M which makes the secondary moment smallest is the straight line M which makes "m" in the expression (4) minimum. To make "m" in the expression (4) minimum, θ and ρ satisfying the following conditions (5) and (6) are used as those in the expression (4).

$$\theta: \quad \sin 2\theta = b/(b^2 + (a - c)^2)^{1/2},$$
$$\cos 2\theta = (a - c)/(b^2 + (a - c)^2)^{1/2} \qquad (5)$$

$$\rho: \quad \rho = -x_0\sin\theta + y_0\cos\theta \qquad (6)$$

The expression (6) ($x_0\sin\theta + y_0\cos\theta + \rho = 0$) indicates that the line passes through the center of gravity of the set of pixels.

In the expressions (5) and (6), "a," "b," and "c" are

indicated by expressions (7), (8), and (9), respectively. (x_0, y_0) indicates the coordinates of the center of gravity of the set of pixels.

$$a = \sum_i (x_i - x_0)^2 \qquad (7)$$

$$b = 2\sum_i (x_i - x_0)(y_i - y_0) \qquad (8)$$

$$c = \sum_i (y_i - y_0)^2 \qquad (9)$$

As a second example of the processing for detecting a direction in which the conference participant HM1 pays attention, to be performed in the attention-degree-information generating section JB1 of the teleconference device TCD1 according to the present embodiment, the detection of the face direction of the conference participant HM1 can be taken, which will be described below.

Fig. 61 shows a flowchart of processing for detecting a face direction in the attention-degree-information generating section JB1.

In Fig. 61, the attention-degree-information generating section JB1 receives original image data, such as that shown in Fig. 62A and Fig. 62B, of the face of the conference participant HM1 from the monitor device MDm disposed at the front of the conference participant HM1 in step S21. In the next step S22, the attention-degree-information generating

section JB1 uses the color information of the received face images to detect a skin area and a hair area. More specifically, the attention-degree-information generating section JB1 extracts skin-color and hair-color areas by using the color information of the received face images, and detects a skin area "se" and a hair area "he" by the extracted color areas, as shown in Fig. 63A and Fig. 63B.

In the next step S23, the attention-degree-information generating section JB1 specifies frames for detecting the center "fg" of gravity of the total area "fe (= "se" + "he")" of the skin area "se" and the hair area "he" and the center "sq" of gravity of the skin area "se," as shown in Fig. 64A and Fig. 64B. The frames are specified, for example, by setting zones in the vertical direction in the images. More specifically, for example, the upper end "re" of the total area "fe" of the hair area "he" and the skin area "se" is used as a reference, and a zone is specified between a point a length "const_a" below the upper end "re" and a point a length "const_a" + "const_b" below the upper end "re."

Then, in step S24, the attention-degree-information generating section JB1 obtains the center "fg" of gravity of the total area "fe" of the skin area "se" and the hair area "he" and the center "sq" of gravity of the skin area "se" within the frames specified in step S23. In a subsequent